ENGINEERING NEWS-RECORD

y engineers in the Southwest Pacific develop port facilities on an island evacuated by Japs.

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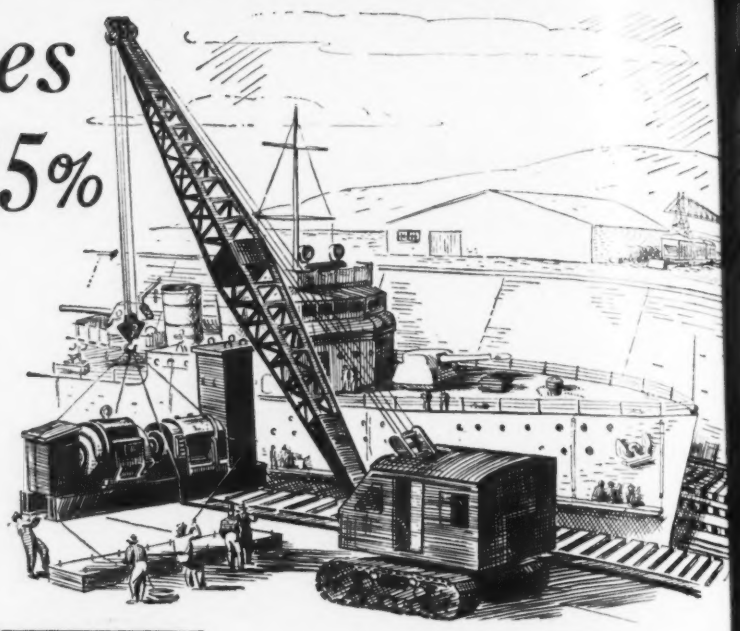
The Motor-generator Set that Saves Copper...85%

By
W. P. HEARSMANN
Industrial Department
General Electric Company



SUPPOSE you have grown up with ships—not sailing them but building and repairing them. And assume you have become the manager of a large shipbuilding and repair concern. With the outbreak of war you find that you have to expand your repair-dock facilities to meet the increased demands upon them.

In order to give adequate service to the ships that will depend upon your port facilities, you know that the dock must be equipped to supply several types of electric power; 110-volt, d-c auxiliary power; 110/220-volt, 3-wire auxiliary power; 110-volt, 3-phase a-c; and 220-volt, 3-phase a-c. Lately, too, ships are being equipped with 440-volt, 3-phase a-c power.

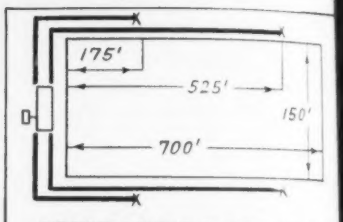
Obtaining copper for the necessary electric cables presents a serious problem. You recall having seen docks with cable ducts (in cross section) as big as 5 to 6 feet high and 3 to 4 feet wide, in order to supply ships with so many different types of electric power.

You talk the problem over with several manufacturers of electric equipment, and one of them suggests a system for your dock which will enable you to service any ship, and which will require considerably less copper than the conventional layout!

Instead of providing heavy copper ducts to supply both a-c and d-c, he suggests that you lay down a *basic network of relatively light copper to supply 2300-volt a-c over the entire dock area.* He points out that by this means several thousand kilowatts can be supplied at any point of a thousand-foot drydock, with power-outlet receptacles spaced as closely as desired. At these receptacles can be placed *portable unit motor-generator sets*—consisting of motor and generator, control, and motor magnetic switch. They can easily be moved about by the cranes, which are part of your standard dock equipment. Of course, rectifiers can be used, and in cases where a-c power is needed, portable transformers can be placed at the power receptacles. The shore cables from the ship are then connected to the terminal receptacles which have been provided on the portable equipment.

While this suggestion may sound revolutionary, it has been recently applied successfully by the General Electric Company. The saving on copper can be computed from the accompanying diagrams. *The advantages of the system shown in Fig. 2 are that the voltage is improved, distribution losses in the cables are reduced, and 85 per cent of the copper normally required is saved.*

This is another example of the application of experience and skill by General Electric engineers to solve a problem created by today's conditions. If you have similar problems, we would like to work with you. General Electric Co., Schenectady, N. Y.

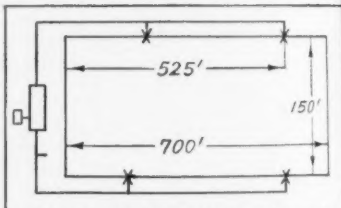


CIRCUIT LAYOUT to deliver 125 kw, 125/250 volts d-c at four designated distribution centers from an a-c–d-c conversion substation.

REQUIRES 1850 feet of d-c circuit cables, including lead-ins consisting of two 500,000-cm mains and one 4/0 neutral.

6900 pounds of copper needed

Fig. 1



2300-VOLT SYSTEM required to supply a-c power at four designated points to portable 125-kw 125/250-volt unit motor-generator sets.

REQUIRES 1350 feet of 3-conductor a-c cable, including lead-ins.

1045 pounds of copper needed

Fig. 2

GENERAL ELECTRIC
855-30-1200

The Army-Navy 'E', for Excellence in the manufacture of war equipment, now flies over six G-E plants employing 100,000 men and women.

The Week In Engineering and Construction

GINEERING NEWS-RECORD • FEBRUARY 4, 1943 • VOLUME 130 • NUMBER 5

Announce plans for new "Big Inch" oil pipeline

ckes says new line will be 20-inch pipe, 836 miles in ength, to bring supplementary supply from Texas oil elds. Construction work to start in March

troleum Administrator for War old L. Ickes announced last week that is scheduled to start in March on construction of a second large oil line to improve movement of fuel to East Coast. The new line, an 836-, 20-in. conduit designed to deliver ,000 barrels of petroleum products y from Texas, will connect with tank loading points in Illinois and Indiana. ckes' announcement followed War duction Board approval of the proj- subject to final review by the Re- rements Committee. If work starts proceeds on schedule, and if there no interruptions to the flow of con- ction materials, the line can be com- ed on or about Sept. 1. Estimated is $44,000,000, and the Defense Plant rporation will be requested to finance project. War Emergency Pipelines, , the non-profit company now con- cting the "Big Inch" line from the as oil fields to the east coast, will ld the new line.

The new line will deliver light petrol- m products from refineries in the aumont-Houston area of Texas to minals at Norris City, Ill., and Sey- ur, Ind. Its operation will result in a additional delivery by tank car of ,000 barrels of petroleum products ily to the eastern seaboard consump- n and export centers.

Plans call for the use of 20-in. seam- s steel pipe on the main 836 mile sec- n, but welded pipe will be installed if liveries of seamless tubes cannot be ured in adequate quantities to main- n uninterrupted construction. Eighty- ee miles of 16-in. pipe will be laid as eed from Houston to Beaumont, and miles of 10¾ in. pipe will be laid as other feeder line from Port Arthur to aumont. Thirty-four miles of second- nd 8⅝ inch pipe will be laid as re- ery tie-ins near Baytown and Texas y. Sixteen pumping stations, equipped with 44 motors and pumps will be installed to maintain the 235,000 barrel-a-day flow.

This newest pipeline will be laid for more than half its total length along the same right of way already traversed by the "Big Inch," thus reducing construction costs needing no land purchase.

Navy asks $210,000,000 for drydock construction

A globe-girdling network of mobile drydocks for repairing United Nations vessels was forecast last week, when the Navy Department asked Congress for an appropriation of $210,000,000 to finance construction of the drydocks.

Navy Under-Secretary Forrestal explained in a letter to the Congress that there was a "pressing need for vastly increased ship drydocking facilities that can follow the fleet or accompany it all over the world."

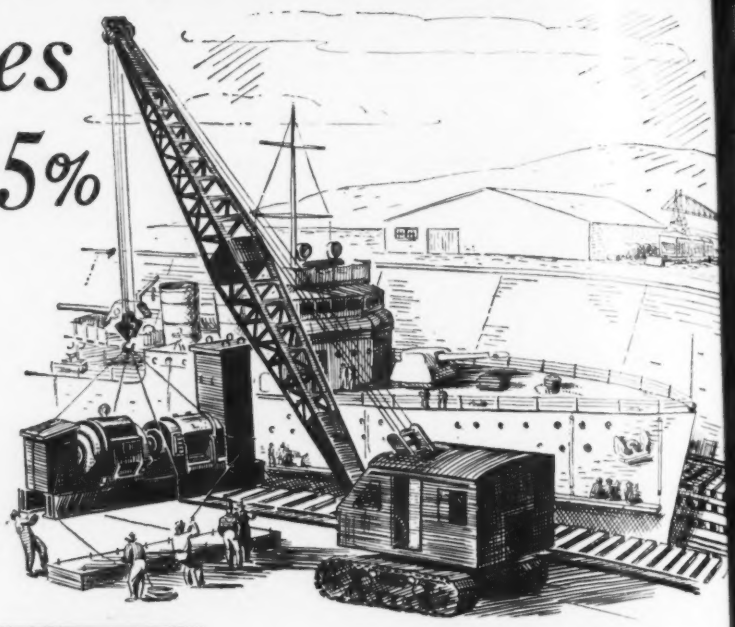
The Navy recommended construction of at least five floating drydocks for vessels the size of cruisers, 18 for destroyer tonnage and 25 for patrol craft.

Engineers move into evacuated Jap base

As U. S. forces continue to push the Japanese from their positions in the Southwest Pacific, scenes such as this occur with increasing frequency. This harbor, recently used by the enemy, is being rehabilitated by the Corps of Engineers as an American base. Construction equipment moves along the harbor road lined with drums of fuel for airplanes and motor vehicles.

Similar construction operations will be repeated all over the world in 1943. In recognition of this fact, a special group of articles in next week's Annual Review Issue will be devoted to "Construction Overseas". Two of these articles are concerned with the work of the Army Engineers and the Navy Seabees. They will reveal what these engineers and construction men in uniform are doing to consolidate and support the gains of our combat forces.

The Motor-generator Set that Saves Copper...85%



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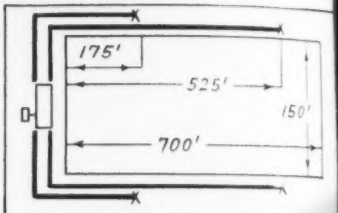

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(Vol. p. 153)

Construction Communiques

Engineering News from the Battle Fronts

New Guinea—A copyrighted report in the New York *Herald Tribune,* Jan. 24, received by wireless, reveals the important part played in the recent Buna victory in New Guinea by Jack Sverdrup, consulting engineer of St. Louis, now Col. Leif J. Sverdrup, of the Corps of Engineers. It concerns an airfield at the small native village of Wanigela, 70 miles southeast of Buna, where the first American troops to cross the Owen Stanley Mountains were landed by fifty planes last October. Says the report:

"Even before these air-borne troops arrived, an American colonel of engineers had reconnoitered the entire area on foot and had supervised the native construction of an airfield which made it possible for the Americans and an initial Australian battalion to land there. The officer was Colonel Leif J. Sverdrup, of St. Louis, who volunteered at general headquarters early in August to lead a small party into the interior of New Guinea in search of airfield sites.

"Wanigela was selected as a likely spot, and almost entirely with native labor Colonel Sverdurp constructed an airfield in this patch of tropical kunai grass, and continued with other installations necessary to an initial base. Nothing except the most primitive of native tools and native food were available. As a result everything had to be transported by air from established bases at Port Moresby, 150 miles westward across the mountains, or from Milne Bay, about 100 miles southeast."

When this action took place, Jack Sverdrup had already seen over a year's service in the Southwest Pacific, having gone out there as a civilian consultant to the Corps of Engineers on a mission that was to take six weeks at the most. Instead, weeks lengthened into months, and as fast as an airfield was established on one island he was moved on to another. A civilian no more, according to the above report, he is continuing on this vital, exciting and dangerous work, apparently as a member of the staff of Brig. Gen. Hugh Casey.

Brazil—The tragic crash of a great Ferry Command airliner in Dutch Guiana last week, with the loss of thirty-five Africa-bound Americans, calls attention to the busy air-supply route it was following from the United States to the battlefronts in Europe, Africa and Asia, a route which engineers and construction men have lined with airfields during the past two years. Probably the airliner had just left one of these fields at Georgetown, British Guiana, having previously stopped at or flown over others at Puerto Rico, Antigua, St. Lucia and Trinidad, and was heading for others at Melem and Natal in Brazil. Almost certainly it was going to Natal, for this is the jumping-off place to Africa and the string of fields there, a product of the construction forces of Pan-American Airways. Natal is one of the big bases of the chain, present headquarters of the South Atlantic Wing of the Army Air Transport Command. Those who may have visited Parnamarim Field at Natal before the war would not recognize it now in its role of one of the world's biggest and busiest air terminals.

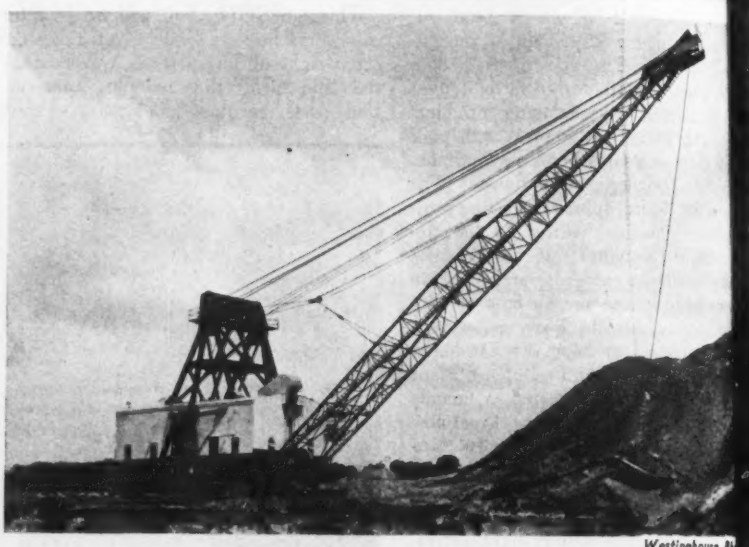
North Africa—The ingenuity and daring of a young American engineer officer recently was credited with saving [illegible] and damage at a Tunisian air base.

According to an Associated Press dispatch, the gasoline and ammunition dump on the airdrome was set afire by a German raid. Shells in the dump were beginning to explode one by one.

Lieut. Robert Parker, an engineer officer recently stationed at March Field, Calif., climbed into a big bulldozer, lowered the blade into the dirt and charged straight at the blazing dump. The gamble worked, the fire being smothered as the heavy machine rolled up earth ahead of it. Parker escaped injury.

Southwest Pacific—A detachment of the Navy's "Seabees" construction battalion recently won a citation from Admiral William F. Halsey, Jr., commander of the South Pacific area and the South Pacific force, for their action outside their regular duties.

(*Continued on page 6*)



Westinghouse Photo

Huge dragline makes 35 to 70 ft. stripping economical

A 25 cu. yd. capacity walking dragline—said to be the largest in the world—is profitably excavating 35 to 70 ft. of overburden to uncover a 3 ft. vein of coal. Stripping operations in anthracite mining are generally limited to about a 5 to 1 ratio between depth of overburden and coal, but the ratio is 3 times as great at the Northern Illinois Coal Corp's strip mines near Wilmington, Ill. where this machine is working.

The dragline has a 180 ft. boom and a total connected electric load of 2,150 hp. Two 700 kva. motor-generator sets and special controls provide the exact motor speed needed at each part of the operating cycle by varying the resistance in the separately excited field circuit of the generator.

Up to 464 cycles of the dragline have been made in 430 minutes of a nominal 8-hr. shift, moving more than 11,500 cu. yd. of earth. Despite handling 25 cu. yd. per minute, the operator feels little strain.

While working, the machine rests on a circular base, the diameter of the full width of the rig. When moving, shoes actuated by a crank arm on a through shaft are brought to contact with the ground, lift and move the machine ahead as "throw" of the crank continues. When the crank passes low center, the shoes are picked up and moved ahead for another cycle. The machine was built especially for the stripping operation by the Marion Steam Shovel Co., Marion, Ohio. The walking motion is controlled by a Westinghouse development.

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Construction record set in big power plant

wo 85,000 hp. units of the Shipshaw lopment on the Saguenay River in bec were put into operation recently, than 15 months after the start of , according to information made ic last week by the Canadian Press . A third unit is about ready for ice. Six units, or a total of 510,000 are included in the present work.

Started year ago

egun in October, 1941, to supply er for the aluminum plants of the minum Company of Canada, little been made public concerning prog- on this work due to war conditions recently when Canadian Minis- f Munitions Howe reported that this t project, which he compared to lder Dam, was nearing completion ss than half the time originally esti- d as required for its construction, ite severe climatic conditions.

onstruction of the Shipshaw plant ks the second stage of a two-stage lopment of the remaining 205 ft. of between tailwater of the Isle Ma- e plant at the outlet of Lake St. John tidewater in the lower Saguenay r. The first stage, the Chute-a-Caron t (*ENR*, Dec. 5, 1929, p. 889) was into service in 1931. It consists of a 200 ft. high across the Saguenay r with a power station developing ft. of head. That dam forms the rsion dam for the Shipshaw develop- t, which includes the construction of version canal roughly parallel to the r to a forebay a few miles downstream which tunnels and penstocks carry r down to the powerhouse. Shown e photograph (right) is the first half e powerhouse and the tailrace to the r. Ultimately, the powerhouse will e an installed capacity of 1,020,000 after which time the Chute-a-Caron t will be used as standby and for ndary power. That plant has a ca- ity of 335,000 hp., which has been lemented by temporary installation wo of the Shipshaw units.

Capacity 1,355,000 hp.

hus the two plants will have a total acity of 1,355,000 hp. In comparison, Boulder plant will have a total ca- ity of 1,830,000 hp., of which 1,270,- hp. will be installed before 1944.

ontractors on the work are the Foun- on Company of Canada.

lso under construction by the Alumi- n Company of Canada is a large age reservoir on the Peribonka River, of the tributaries of Lake St. John, which the Saguenay River forms the et. This reservoir will add to the r supply of the Saguenay plants.

Supreme Court rules on contract delays

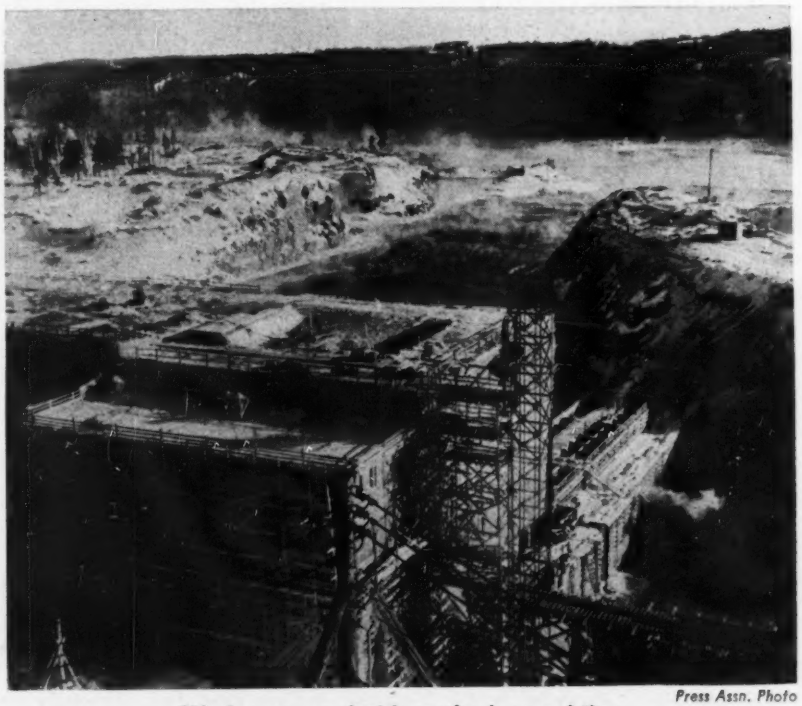
Delays in completing government contracts due to floods cannot always be considered as unforseeable, according to the U. S. Supreme Court in a decision rendered Feb. 1 in the case of the United States *vs.* Brooks-Calaway Co., contractor on levee work along the Mississippi River. In earlier court action the contractor brought suit to recover $3,900 which was deducted from his contract price for liquidated damage for delays in completing his contract.

Work on the contract was delayed 278 days by high water, of which the contracting officer held that 183 days were due to conditions normally to be expected and 95 were unforseeable and so covered by Article 9 of the standard form of government construction contract. The Court of Claims held that liquidated damages should not have been assessed for any of the 278 days caused by highwater as highwater is a "flood" under Article 9 of the government contract, and that all floods are unforseeable *per se.*

The Supreme Court holds that the construction of Article 9 adopted by the lower courts is contrary to the sense and purpose of the proviso concerning unforseeable delays in the government contract. It quoted with approval the dissenting opinion of Judge Madden of the lower court who said: "The normally expected highwater in a stream over the course of a year, being forseeable, is not an 'unforseeable' cause of delay. Here the plaintiff's vice-president testified that in making its bid the plaintiff took into consideration the fact that there would be highwater and that when there was, work on the levee would stop."

In reversing the findings of the Court of Claims, the Supreme Court held that a logical application of its findings would even excuse delays from causes listed in Article 9 although they were within control of the contractor. It said that the purpose of the proviso in question is to remove uncertainty and needless litigation by defining with some particularity the otherwise hazy area of unforseeable events which might excuse non-performance within the contract period. Thus contractors know they are not to be penalized for unexpected impediments to prompt performance, and since their bids are based on forseeable and probable rather than possible hinderances, the government secures the benefit of lower bids and more bidders.

In another decision rendered Feb. 1 the Court said that employees of toll bridge companies are covered by the provisions of Fair Labor Standard Act. The ruling came in a suit brought by employees of the North Shore Corp. against the corporation, which owns toll bridge connecting Fort George Islands, Florida, with the mainland.



Press Assn. Photo

Shipshaw power plant in service in record time.

Ingenious channelization of traffic eliminates two grade crossings and dangerous road intersection. Trolley tracks will be taken up and b service substituted as soon as new buses become available. Thin median strip keeps traffic in proper lanes.

Cincinnati eliminates dangerous crossings

Eliminating two railroad grade crossings and a dangerous intersection of three heavily travelled main roads, the City of Cincinnati, Ohio, recently opened to traffic its Erie Ave.-Brotherton Ro grade separation project. Total cost the work, which included two railro overpasses and a bridge over a sm creek, was $513,000.

Simple construction, emphasized by the cleanly-built handrails shown here, characterize the bridge over Duck Creek.

The Erie Avenue grade crossing of t Pennsylvania Railroad's tracks was elim nated by carrying the street over the ra road on a three-span, continuous ste beam bridge with spill-through type ab ments. Span lengths are 46 ft., 62.5 and 46 ft., center to center of bearing The bridge carries six 10-ft. traffic lan divided by a narrow raised median str A sidewalk 8 ft. 6 in. wide is provided each side. Due to grade differences caus by the elevation over the tracks, an ov pass also had to be constructed to car the street over Red Bank Road. Th structure is very similar to the railro overpass.

Streetcar tracks that ran along Er Avenue had originally been scheduled f abandonment, since the trolley servi was to be replaced by a bus line. Ho ever, since wartime restrictions made impossible to obtain new buses, the trac were temporarily relaid on one outsi lane of the new pavement. They will taken up when conditions permit.

The Brotherton Road grade crossi

n in dotted line on map) was elimi- by relocation of the road to inter- Erie Avenue just before that is carried over the tracks. The ection of these two arteries is chan- d for added safety in controlling and traffic lights have been in- d. The relocation also involved ruction of a bridge over Duck Creek. structure is of 42-ft. span and pro- a 40-ft. roadway and two 8-ft. 6-in. alks.

cess from Red Bank Road to Erie ue is provided by an approach ramp the former intersection of the three ways. A channelized intersection has been provided for a proposed gh street to be built at some later into the town of Mariemont.

e project was financed jointly by the and federal governments. Plans for bridge were prepared under super- n of W. S. Hindman, chief engineer ridges and railroad crossings for the State Highway Department. Arthur was project engineer for the depart- and P. S. Bookwalter was division neer. The principal construction con- was held by Visintine & Co., Colum-

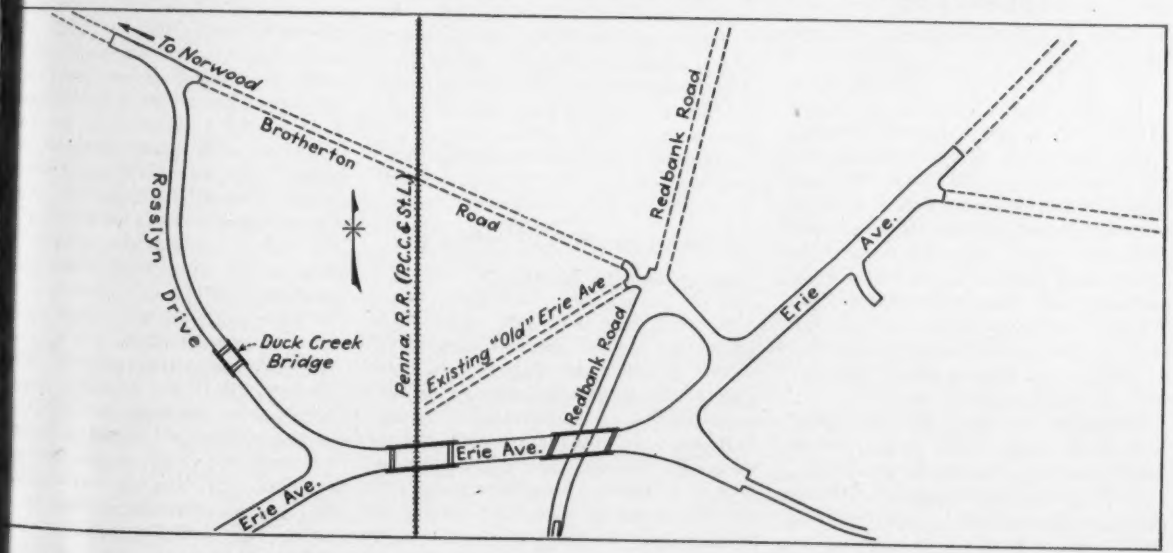
* * *

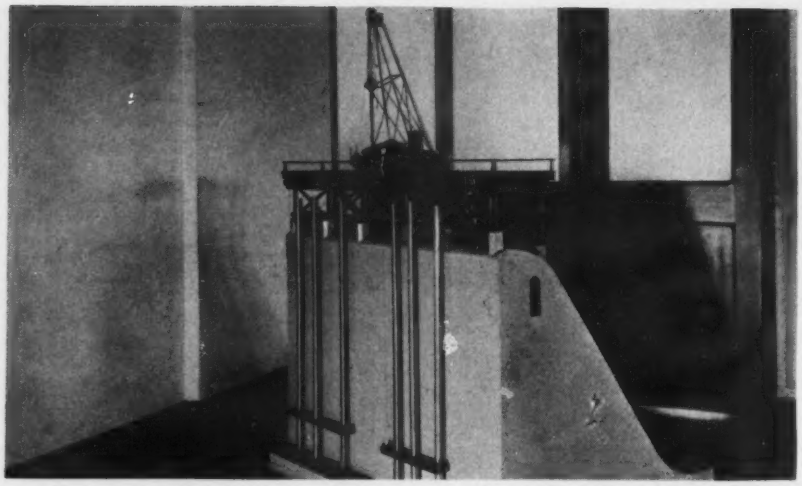
Tinker photos

Erie Ave. traffic flows freely now across a heavily-travelled track of the Pennsylvania railroad, formerly crossed at grade. This bridge is a three-span continuous steel beam structure, span lengths being 46 ft., 62.5 ft. and 46 ft., center to center of bearings.

Raising the road to cross the track (upper picture) made it necessary to carry Erie Ave. over Red Bank Road. Almost exactly similar to the bridge over the railroad track, this structure has the same span measurements. Note clear view of approaching traffic provided.

shows in dotted lines the location of old roads eliminated by the new align- t. Erie Ave., and Brotherton Road have channelized and relocated to eliminate two railroad grade crossings, and carried Red Bank Road. The new Erie Ave. is a ane highway, divided by a thin raised ion strip to further insure safety.





Model shows Hales Bar under-flow reduction

The model above illustrates the method used to build a subsurface concrete curtain wall to stop the flow of water, once 1700 cfs., under Hales Bar dam on the Tennessee River (ENR, Nov. 6, 1941). Large openings exist under a considerable length of the dam and extend from the rock bed of the river to more than 100 ft. below it. There are horizontal fissures caused by washing out a shale bed and vertical openings resulting from the solution of calcites in the limestone.

The method proving successful for sealing the flow is removal of 18½ in. dia. cores with a calyx drill and filling the holes with concrete to form a cutoff wall. Holes are first drilled at 24 in. centers and asbestos-cement pipes dropped into the hole and filled with concrete. Interconnecting holes are then drilled slightly upstream and into adjacent concrete filled holes making a continuous cutoff wall.

Shown is a model of the calyx drill on a section of the dam. The vertical pipes extend through the water to the river bed, and ened pipes in each suspended templet being turned a few inches into the rock to hold it securely. A long drill bit is inserted through the pipes to cut and remove the cores. The wire supported templet serves as a guide to assure interlapping of the holes.

Work started in 1941 and is now about 80 percent complete. Supplemental concrete grouting and some asphalt seal work is also being done.

Except for short periods, flow of the Tennessee River has been sufficiently high recently that water has gone over the spillway of the dam obstructing a view of boils that formerly appeared downstream caused by water flowing under the dam. Visual observations indicated that flow in the completed area had been virtually stopped.

The work is being done by Tennessee Valley Authority forces under direction of Lewis A. Schmidt, Jr., and H. B. Towers.

Construction Communiques

(*Continued from page* 2)

According to *Bee Lines*, official Seabee publication, a battle-scarred aircraft carrier put into a southwest Pacific port damaged in a recent battle. Regular repair forces being lacking, a crew of Seabees was put to work on the carrier. While the work was under way, the carrier was ordered to put to sea immediately and engage the enemy. The Seabee contingent remained aboard, kept on working and repaired the ship so that it could operate at full efficiency when it engaged in combat.

South Pacific area—The emergency hospital in which Capt. E. V. Rickenbacker and his companions recuperated after their rescue following a mid-Pacific plane crash was built by Seabees in 24 hours time to meet the emergency, according to the official Seabee publication.

Col. Lloyd Leech, commander of the island to which the rescued airmen were brought, put a Seabee group to work on receiving word the men were coming, and within a day a field hospital complete with concrete decks, screens all around and a corrugated iron roof had been erected.

. . .

More than 8,000 miles of track built in 1942

American railroads built more than 8,000 miles of track during 1942 in their efforts to speed the transport of war goods, Robert S. Henry, assistant to the president of the Association of American Railroads said in a radio broadcast last week. Mr. Henry was a speaker in the sixth of a series of broadcasts sponsored by the Associated General Contractors of America.

Postwar planning urged on engineers, contractor

Engineers, architects, material
and contractors recently were urged b
business leader to organize their
local committees for postwar planni
and then join their efforts with those
local business and industry groups
insure full employment after the war

Proponent of the plan was George
Haas, sales manager of the Stran S
Division, Great Lakes Steel Co.,
chairman of the technical committee
The Producers' Council. A long-ti
member of the American Institute
Architects, Mr. Haas was princi
speaker at a joint meeting of the C
cinnati chapter of the Institute and
Southern Branch of the Ohio Society
Architects, with the Cincinnati chap
of the Producers' Council.

"The broad objective of the Counc
postwar program," Mr. Haas said,
the development, in cooperation w
other branches of the construction
dustry and major allied groups, of pl
and policies to insure that construct
will perform its proper function in s
port of a full postwar economy and c
tribute the largest possible share towa
full employment and general econo
and social stability.

"The Producers' Council, a cross-s
tional organization of manufacturers
all kinds of building materials and equ
ment, has assumed the responsibility
such postwar preparations for the ma
facturing interests. It is proceeding w
specific studies that will be of benefit
the other interests in the industry as w
as to producers."

. . .

Navy construction chief on missing plane

Capt. Robert E. Thomas (CEC) US
was a passenger on the Navy transp
plane whose wreckage was found at s
last week, after an unsuccessful attem
to land amid a fog over the San Fra
cisco area. The plane reportedly w
flying to the mainland from Hawaii.

Capt. Thomas was officer in char
of naval construction in the Pacific. Fro
1938 to 1942 he had been public wor
officer of the 13th Naval District, wi
headquarters at Bremerton, Wash., fro
where most of the early Pacific Islan
base work was handled.

A civil engineering graduate of t
University of Illinois in 1915, Capta
Thomas spent two years with the Illino
highway department before joining t
Civil Engineer Corps of the Navy as
lieutenant (jg). He had served at No
folk, New Orleans, Guam, Mare Islan
Panama and in Washington.

MEN AND JOBS

. Swarthout, former assistant resi- lant engineer at Brunswick, Ga., e U. S. Maritime Commission, has ransferred as acting resident plant er to the McAvoy Shipbuilding Co., nah, Ga.

n E. Cole, stationed at the army er's office at Albuquerque, N. M., en promoted to lieutenant colonel, **aul Wilson** of the same station has named a major.

James, formerly general manager North and Middle Loup Public and Irrigation Districts in Ne- a, has been appointed chief engineer Cornhusker ordnance plant at Island, Neb.

T. Messer, of Ames, Iowa, an engi- with the Iowa State Highway Com- on, has been ordered to report to aval Training School of Communica- at Harvard University.

Johnson, formerly manager of util- at Marshall, Mo., is now with the Engineers office at Omaha, Neb.

E. Loer has resigned as Indian- s, Ind., traffic engineer to become rtner in the Henry Steeg & Asso- Construction Co.

William P. Mayben, of the Corps gineers, in charge of construction of rbase in northwestern Nebraska, has transferred to Pratt, Kan.

in Taylor, maintenance engineer for Alabama state highway department, ccepted a commission as captain in Corps of Engineers, reporting at Claiborne, La. **George W. Phillips,** homasville, has been named state way maintenance engineer to serve g Taylor's absence.

ge E. Owens, chief engineer for the man Construction Co., at Kansas Mo., has been commissioned a cap- in the Corps of Engineers.

appointment of **Arthur B. Henry** as tant Indianapolis, Ind., city engineer, been announced. Mr. Henry, a civil eer practicing since 1916, has spe- ed in design, construction and oper- of water, light and sewage disposal s, and has had wide experience in construction of drainage and flood ol projects.

. Ferguson has been appointed resi- engineer for Lemhi County for the Idaho State Highway Department.

Walter Coulter has been named superintendent of the waterworks department of New Comerstown, Ohio, succeeding **Hollis Stewart,** who resigned recently.

A. F. Reinke has been appointed city engineer for Vincennes, Ind.

Maurice Albertson, a recent civil engineering graduate of Iowa State College, has become a junior engineer with the Tennessee Valley Authority at Knoxville, Tenn.

R. A. Currie, a designer in the bridge department of the Missouri state highway department, has been commissioned a lieutenant in the Navy.

Bert N. Paxton, Oroville, Cal., engineer and surveyor, has been appointed Butte County engineer, replacing **J. A. Bumgarner,** of Oroville.

William W. Dillard, Jr., assistant to the area engineer, Radford Ordnance Works, has been promoted to the rank of captain.

Hubbard D. Burnum, formerly connected with the Alabama highway commission, has joined the Navy as lieutenant commander.

Walter P. Koetitz, construction engineer and one time director of WPA for Alameda County, Calif., has been named chief of the California State Division of Immigration and Housing by Governor Earl Warren.

D. C. Wesche, city engineer of Manhattan, Kan., has been appointed county engineer of Riley County to succeed W. F. Kipper who recently resigned to enter the armed forces.

Walter Buell, formerly of the Buell & Winter Construction Co., has become a partner in Buell, Winter and Beuttler Consulting Engineers at Sioux City, Iowa.

Albert J. Bouta was named regional construction supervisor for the Federal Public Housing Authority in the Fort Worth, Texas, area, recently.

Orville K. Brewer, former assistant county engineer, has been appointed Page County, Iowa engineer. He succeeds **Floyd Rubey,** now employed on the Alcan Highway project.

Lieut. William F. Merritt, USNR, of New York City, has been named officer in charge of construction at a naval air station being built in Georgia.

Wallace B. Boggs, Oakland, Cal., civil engineer and chief engineer of the Broadway low-level tunnel project, has been appointed Alameda county surveyor.

Herbert J. Baker, who was supervising engineer for the Defense Plant Corp. in construction of a factory building at North Hempstead, L. I., has been transferred to New Orleans for similar duty on construction of an aircraft factory there.

W. H. Webb, of Raleigh, N. C., former engineer for the North Carolina State Highway and Public Works Commission, is now stationed at the Engineer Replacement Training Center at Fort Leonard Wood, Mo.

Lee T. Grider, of Los Angeles, Cal., for many years general superintendent for Bent Brothers, Inc., has been made project manager for the Western Construction Co. on the second Nisqually power development for the city of Tacoma, Wash.

G. G. Cathey, USNR, on duty at the Marine Barracks in North Carolina, has been promoted to the rank of lieutenant (jg) and has been made public works officer at Coco Solo, Canal Zone.

M. B. Preeman, formerly secretary of the F. O. Cunner & Son Co., Cleveland, Ohio, builders, is now a first lieutenant in the U. S. Army, stationed at the Frankford arsenal.

Edward Anton, assistant administrative chief of the Denison, Texas, district army engineers, has been transferred to the Southwestern Division at Dallas.

Capt. Ralph T. Smith, area engineer at Moody Field, Valdosta, Ga., has been promoted to the rank of major.

R. C. McCullough, senior superintendent of the Pittsburgh district of the Ohio River, will retire Jan. 31 after more than 51 years of serving the U. S. Engineer Department. He entered the government service in 1892 as a laborer, being promoted successively to become an engineer in charge of construction of dams and locks along the river.

Earle M. Rader has been appointed county engineer of Dade County, Fla., succeeding **Capt. Edmund Friedman,** now a member of the army.

Roy W. Scheufele, executive officer of the Portland Army Engineer District, has been promoted to the rank of major.

Blast throws bridge landward for salvage

The 232 ft. span of the Central Viaduct spanning the Cuyahoga River at Cleveland, Ohio, was dropped 100 ft. and thrown 40 ft. landward for salvage on January 23. The high sandstone pier supporting one end of the span was blasted on the land side to make it furnish power to draw the span toward the pier.

Preparations for the wrecking and mantling included placing a brace from the bottom of the supporting bent (see picture), to the first panel point to assure that the span would move landward from the pier. A temporary bent with rocker bottom was placed to support the superstructure at the opposite pier and so arranged that it would move with the span, allowing it to fall entirely clear of its pier.

The floor system at the end of the bridge expected to fall in the river was removed, leaving a total of about 4,000 tons of steel in the span.

Pier undermined by blasting

The sandstone pier on the side of the river to which the span was to be moved was undermined by blasting. This was accomplished by drilling 28 holes along the bottom of the pier, about 2 ft. above ground level, and blasting out part of the stone. The first shot made a cut about 4 ft. deep the width of the pier. The opened space where a double row of holes was inserted deeper into the sandstone. The second shots were entirely successful in throwing the pier to the ground, bringing with it the span as anticipated. The pier weighed 2,000 tons and a total of 224 lb. of dynamite was required to undermine it.

To assist in cracking the pier and starting it to fall, two 1¼ in. cables were attached above the pier anchored to the ground. A continuing strain on the cables was taken by inserting a block and tackle with pulling power provided by the boom on a crawler crane.

It was expected that the bridge would move about 35 ft. landward in falling and the actual measurement after it landed was 40½ ft. The falling bridge did not strike the protection fenders on either side of the river and came down exactly as planned. Only a minor amount of steel went under water in the river and crews immediately started removing it to clear the channel.

About 4,500 tons of metal, all wrought iron except the main span, and 500,000 b.ft. of timber decking and sidewalks

(*Continued on following page*)

In the top picture, an added frame under ... pulls bridge landward as pier—previously gouged on land side—is blasted. Arm ... to swing free of the opposite pier, 232 ft. ... falls into the Cuyahoga River (Center pic... At bottom, fender piles on both sides of river are untouched and only a small am... of steel is under water as span comes to ...

ng will be salvaged for war use. d in getting the steel from the to the mills for scrap was the for the means used for salvage. ntire viaduct, now being wrecked, ,836 ft. long and at an average of about 85 ft. above the ground water. Beside the main river span were 23 other spans ranging in from 45 to 150 ft. All were sup- by steel towers except for five te and masonry piers near the The viaduct crossed tracks of five nt railroads.

ecking was started November 16 onstant passage of ore boats on the made it necessary to keep the chan- en as long as lake navigation could ntinued. The alternative to drop- the one span into the river would been to delay any dismantling of ructure until close of the navigation and then to run big derricks out ch end of the viaduct to lowering usses to barges on the river. This l have required securing some of rgest derricks in the country, diffi- t this time, and would have delayed e of the scrap. Salvage of the en- tructure is now nearing completion. e wrecking and salvage of the struc- is being done under a contract from overnment agency, War Materials, of Pittsburgh, Pa., awarded to the land Wrecking Co. of Cincinnati, For the latter firm, John D. Powell neral superintendent and project ger in charge of the work. Wrecking e river span and nine other spans railroad tracks and streets is being under a subcontract by M. B. Bau- Company of Norwood, Ohio. All work is being done by the Cleve- Wrecking Co. Wilbur Watson & ciates are consulting engineers for ontractors.

• • •

.C. extends sales tax federal contractors

e Senate and House finance commit- of the North Carolina legislature re- y voted to extend the state sales to building materials sold to con- ors on federal projects within the

e vote in favor of the extension of ax came after Edwin Gill, North lina state revenue commissioner, that the move had been suggested e State Advisory Budget Commis- and that a recent supreme court ion had cleared the way for taxing rials sold to contractors for use on al projects. He declared that a er of other states now are levying ilar tax (*ENR*, Jan. 7, p. 12).

Press Assn. photo

Malta buildings subject to heavy bombings

On the tiny island of Malta, in the middle of the Mediterranean Sea—said to the "most bombed" place on earth—enemy attacks have not succeeded in destroying the heavy masonry buildings characteristic of the outpost.

Shown above is a building over the entrance to an elevator (at top right) that carries residents of the island to streets atop the bluffs. The outer wall has collapsed, but the building itself stands.

Reclamation Bureau power output up in 1942

Power plants on Bureau of Reclamation projects in 11 western states produced more than 7¼ billion kilowatt-hours of energy during the calendar year 1942, Secretary of the Interior Harold Ickes said last week.

The 1942 output, speeded to meet the demands of war industries, showed an increase of 75 percent over the production in the calendar year 1941, Mr. Ickes said.

"Substantial additions to capacity at the close of 1942 and early in 1943 now enable the plants on Bureau projects to operate at the rate of nine billion kilowatt-hours annually," the secretary added. "The annual rate will be increased to ten billion kilowatt-hours by midsummer, which is more than the generation in the entire state of Illinois in 1940."

The major part of the Bureau's power output was from Boulder Dam in the Pacific Southwest.

Michigan to build new access highways

Rapid expansion of Michigan's war industries, and increasing military activities within the state make additional access highways imperative, State Highway Commissioner Lloyd B. Reid said last week in an outline of an extensive 1943 access road construction program.

Bids on new construction totalling an estimated $774,000 will be advertised during the next month, Reid said. The work will be on five projects already certified by the War Department. Additionally, the department is studying plans for six other proposed access roads.

THE UNIVERSITY of Kentucky announced recently that men and women with one year or more of college training will be eligible for enrollment in a course in engineering fundamentals. Originally designed for women, the course was opened to men because of the heavy demand for civilian junior engineers and technical assistants.

Above: Construction work at New York's Brooklyn Navy Yard gets close official scrutiny. Inspection party, front row (l to r) is: CHAR B. SPENCER, Spencer, White & Prentis, Inc.; CAPT. W. M. ANGAS, Public works officer; JOHN L. BOARDMAN, J. G. White Engine Corp.; COMMDR. H. C. GRISWOLD; GEORGE G. HOLLINS, and C. A. McCOLLOUGH, J. G. White Corp. Second row: ED LUNDGREN, power division, Bureau of Yards and Docks; RICHARD A. BACKUS, of Voorhees, Walker, Foley & Smith, and CARR BLAKE, Borough superintendent, Dept. of Housing and Buildings, New York City.

MEN AT WORK

Below: Left to right, CHARLES A. LONG, of Bessemer, Ala., newly-elected president of the Alabama Branch, A.G.C.; COL. DOSWELL GULLATT, district engineer, Mobile, and J. H. HOLLEY, Birmingham, retiring president, chat at banquet table during chapter's annual convention.

Below: WILLIAM WHITE (seated), for the past six years manager at Lexington, Ky., and M. J. McGRUDER, city e neer for seven years, discuss municipal practice under war conditions. Their long experience makes them well fitted the job of putting their city on a war basis.

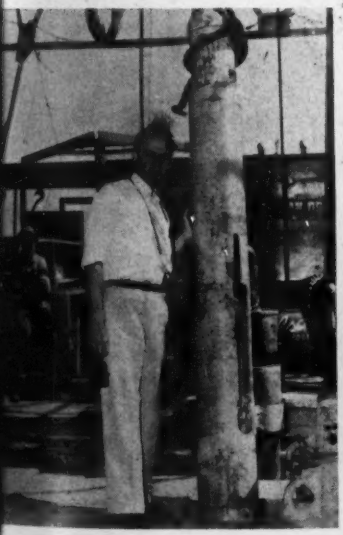
...e: SAMUEL B. MORRIS, dean of engineering at Stanford University, has received two ...l honors recently. He has been nominated to the presidency of the American Waterworks ..., and elected president of the San Francisco section, Am. Society of Civil Engineers.

Above: Hospital construction at an Indiana location gets the attention of A. G. HULMICK, inspector for Charles H. Hurd, Indianapolis, architect-engineer on the project.

Left: BILL FOSTER, engineering editor of the American City magazine, poses jauntily for ENR's cameraman at a recent convention.

Right: EDGAR F. KAISER is general manager of the Oregon Shipbuilding Corp., scene of many record-breaking ship construction projects.

...ow: A. RAYMOND TRAVIS Jr., president ...he American Drilling Co., supervises under... ...ner operations for a deep well water sup... ...at Asbury Park, N. J.



Below: J. C. BIGGINS has been city manager at Newport News, Va., for seventeen years, but reports that the past year has been the busiest in his experience. Large growth of population has caused expansion of water supply, housing and other facilities.

State highway departments seek raises in pay scales to hold employees

Heads of organizations report increasing losses of trained personnel attracted by higher wages offered in war industry field

The Kentucky State Highway Commission last week announced adoption of a three point program designed to raise salaries and wages of highway workers, in an effort to stop them from leaving for jobs elsewhere.

Under the new program, each of nine commissioners is to recommend immediate salary increases, where merited, to district personnel now being paid less than the maximum scale; Commissioner J. Lyter Donaldson is to apply immediately to the War Labor Board for permission to raise all hourly wage scales 10 cents an hour, and a committee of three has been named to make an immediate study of all department salary rates with a view of applying to the WLB for permission to raise them to new maximums.

The wage scale raises would have the effect of raising the pay for common labor from 40 to 50 cents an hour.

Commenting on the reasons for the program, Mr. Donaldson said that the situation is becoming acute. "It is becoming increasingly harder to hold our organization together in the face of higher money our people can make at war work." Without exception, the commissioners reported drastic personnel losses in their districts and increasing difficulty in replacing these losses with competent men.

Iowa boosts pay

New wage scale limits have been adopted for the maintenance department of the Iowa state highway department. Maximums have been increased between 5 and 10 percent to meet rising living costs.

The new scales are: foremen, $30 to $35 a week; mechanic, $30 to $38 a week; dragline operator, $30 to $36; operators, 55 to 70 cents an hour; laborers, 50 cents an hour; and a man and two-horse team, 65 to 80 cents an hour. The scales are based on a 48-hour week, with straight time over 48 hours.

North Carolina faces problem

Declaring that the North Carolina highway department is losing many key men because of "very material increases in salaries paid in war industries," D. B. McCrary, acting chairman of the state highway and public works commission, has advised the state legislature that a bill to provide pay increases for members of the department would be submitted at an early date.

McCrary said that the department had already lost 75 percent of its engineering personnel and said that the department estimates it is getting between 55 and 60 cents worth of results from every dollar its spends due to inexperienced operators and continued use of equipment past the stage where it is no longer economical.

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Urge U. S. connecting route for Alcan highway

The Colorado state senate last week was considering a memorial to the national Congress, asking that immediate plans be made for construction of a master highway through Colorado and other mountain states to connect the Alcan highway and the Pan American highway.

The memorial resolution points out that the shortest and most direct route lies through Montana, Wyoming, Colorado, New Mexico and Texas.

War Measure

Readers of *Engineering News-Record* will observe that the "trim size" of the current issue of the magazine is slightly smaller than that of previous numbers. The reduction in size has been made to enable the publishers to meet an order of the War Production Board limiting the amount of paper that may be used in 1943. Subscribers will note, however, that no change has been made in size of type or in the amount of editorial content per page, but that a substantial saving in paper has been effected merely by trimming the margins.

The publishers have adopted the new size as a war measure and as a contribution to the conservation of manpower and transportation facilities in the production and distribution of paper. Service to the reader has not been sacrificed and will be maintained as far as humanly possible in the face of the problems confronting all of us in our united efforts to win the war.

Construction firm gets "E" award for Northwest work

Forty-six hundred engineers and construction workers associated with the Austin Co. on Navy engineering and construction work aggregating 70 million dollars recently received the Army-Navy "E" award at simultaneous ceremonies in nine widely separated locations in the states of Washington and Oregon. It was the first award for construction in the Pacific Northwest.

The ceremony was broadcast by radio to connect all points in a joint program.

In the course of it work on Pacific Northwest projects, the company built the first p stressed concrete tanks ever used for fuel st age, and developed a new type of construct for seaplane ramps that us.s beams and sl of precast concrete.

Witnessing the principal ceremony, abo are, left to right: Col. Richard Park, distr engineer, Seattle; George W. Plaisted, As vice president, Cleveland; George A. Brya Cleveland, president; W. R. Engstrom, gene manager, and Capt. Henry F. Bruns (CE USN.

WASHINGTON HIGHLIGHTS

RTABLE crushers will be produced in maller number of sizes as a result of nance last week by WPB of Schedule under order L-217. Jaw crushers, now ilable in 63 sizes, will be limited to sizes, and no single producer will be rmitted to manufacture more than nine ferent sizes. Roll crusher sizes are re- ced from 25 to 5.

LS have been introduced into both uses—by Delegate Dimond and Senator ne—calling for the construction of a ond Alaskan highway, following the stal route from Prince George, B. C., join Alcan Highway at Whitehorse.

ATER, power, gas, and steam utilities recognized as essential activities in Selective Service System's Occupa- nal Bulletin No. 9. Employees holding tical occupations in these industries eligible for occupational deferment. bulletin lists several dozen critical cupations.

ost of the construction equipment nufacturing industry will be obtaining terials under the controlled materials n in the second quarter of 1943. The n is optional in that quarter; indus- s unable to get in shape to deal h CMP may continue until the third rter under the production require- nts plan.

However, material allotments under MP take precedence over PRP priority ings, and it is therefore fortunate for industry that it was possible to get der CMP. The job was made easier the fact that output of the industry been scheduled from Washington some time under order L-192. Inclu- n of the industry will not affect the tribution of finished equipment, which ntinues under L-192, changes only the thod by which manufacturers obtain terials.

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Equipment service charge subject to OPA approval

All operating and maintenance service arges made by persons renting con- ruction equipment—such as supplying erating crew, fuel, lubrication and aintenance—must be submitted to the fice of Price Administration for ap- oval.

Under no circumstances, OPA officials id last week, can a dealer or contractor arge more than the rental for the bare achine plus transportation charges pro- vided for in Maximum Price Regulation No. 134, unless such additional service charges have been approved by OPA.

The OPA's statement was made to correct what it said was the opinion of some contractors who believe they can compute their own service charges and add them to the maximum rental rates listed in the schedule. The regulation provides a method for determining a proposed service charge, OPA said, but clearly sets forth that such proposed service charges must be filed with OPA for approval.

To determine his proposed service charge, the lessor of equipment covered by the regulation must compute what his rate for all or a group of such services would have been on March 31, 1942. This rate can be determined in the following manner:

If he had a specific rate invoiced separately from the equipment rentals on that date, this will be his maximum rate for the service. If he had on that date a rate for the rental of bare equipment and another rate combining rental and services, the difference between these two charges constitute his maximum rate for the operating services. Lessors who did not have service rates in effect on March 31, 1942, may propose them by computing what those charges would have been on that date, using the labor and materials prices then prevailing. Maximum service rates may not be determined by subtracting OPA bare rental rates from fully operated rates which lessors had in effect on March 31, 1942.

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Pennsylvania RR to build wood gondola car fleet

One thousand heavy-duty gondola cars, with wood planking placed temporarily in the side sections to conserve steel for the war effort, are to be built by the Pennsylvania Railroad to augment its fleet of open-top cars for transportation of war materials.

Each car will have a capacity of 70 tons. Total cost will be $3,150,000.

JOBS OF THE WEEK

HOUSING, Washington
Sound Construction & Engineering Co., Seattle, Wash., was lowest bidder on housing project when Vancouver Housing Authority, Vancouver, opened bids January 29. $2,706,415 was low offer. Portland Associated Architects, Portland, Ore., are architects.

HOUSING, Maryland
Public Housing Authority, Washington, D. C., awarded contract for constructing temporary housing units to Muhleman & Kayhoe, Inc., Washington, D. C. Estimated cost $1,800,000. A. R. Clas, Washington, is architect.

BUILDINGS, Tennessee
U. S. Engineers, Atlanta, Ga., awarded contract for buildings, Davidson County, to Beers Construction Co., Atlanta, Ga.; electrical work to Edenfield Electric Co., Nashville. Estimated cost $3,500,000. Six Associated Architects, Asheville, N. C., are architects.

BUILDING, Alabama
U. S. Engineers, Mobile, Ala., received lowest bid on building, Tuscaloosa County, from R. P. Farnsworth Co., Inc., New Orleans, La. Estimated cost $2,000,000.

IMPROVEMENTS, Kansas
U. S. Engineer, Kansas City, Mo., awarded contract, improvements, to Kiewit Construction Co., Omaha, Neb. Estimated cost, $3,000,000. Wilson & Co., Salina, Kan., are engineers.

PLANT, New York
Industrial Company awarded contract to Foley Brothers, Inc., Pleasantville, N. Y., for constructing plant. Estimated cost $2,500,000. Electrical work to Charles A. Mulligan, Central Islip, N. Y. Francisco & Jacobus, New York, are architects. Defense Plant Corp. will finance.

DAM, Seattle, Wash.
City Light Department, City Light Bldg., awarded contract, second step of Ross Dam, to General Construction Co., Morrison-Knudsen Co. and J. F. Shea Co., Seattle, $7,144,922. E. R. Hoffman, city engineer. FWA.

ADDITIONAL FACILITIES, Magruder, Va.
Doyle & Russell, Richmond, Va., has been awarded contract for additional facilities by Bureau of Yards & Docks, Navy Dept., Wash., D. C., $9,387,000.

GASOLINE CRACKING PLANT, Cleveland, O.
Standard Oil Company of Ohio, Cleveland, O., awarded contract gasoline cracking plant to E. B. Badger & Sons Co., Boston, Mass. Foundations to H. K. Ferguson, Cleveland, O. Estimated cost, $7,000,000.

Note—Additional bidding and contract news on many projects large and small appear in the Construction News section beginning on page 15.

OBITUARY

Daniel H. Willaman, 40, Salem, Ohio, road construction engineer, died January 24, at Struthers, Ohio.

Guy W. Lanning, former superintendent of bridges and buildings on the Idaho division of the Milwaukee Railroad, and later division engineer for the same road, died January 23, at Milwaukee, Wis.

Andrew J. O'Reilly, 80, retired construction engineer, died at St. Louis, Mo., January 27. For many years he was consulting engineer for the Laclede Gas Light Company and the Union Electric Light and Power Company, and had served for four years on the Missouri Public Service Commission at Jefferson City, Mo.

Gottfried T. Lagerberg, 76, for many years an engineer for the U. S. Coast and Geodetic Survey, died recently at Seattle, Wash. A native of Sweden, Mr. Lagerberg joined the Coast and Geodetic Survey in 1903 and retired in 1936, but was recalled to duty several times since then for short intervals.

John J. Finn, 68, formerly a civil engineer for the New York City Department of Docks, died recently at Yonkers, N. Y.

O. S. Benadum, 61, division superintendent of the Ohio State Highway Department at Fairfield County, died at Rushville, Ohio, January 25.

Jeremiah Hunter, 72, retired deputy chief engineer of the City Finance Department, died recently in New York.

Clarence E. Raynor, 78, retired civil engineer of the Bureau of Public Roads, died recently at Takoma Park, Md. He had been for 15 years assistant district engineer of the Bureau of Public Roads at Montgomery, Ala.

Clyde Shoemaker, 72, retired civil engineer of Philadelphia, Pa., died recently.

Samuel W. Silvey, 73, chief engineer of the Gadsden, Ala. water works, for the past 33 years, died recently at Gadsden.

Conrad D. Harrrington, 58, vice president of the Anglin-Norcross Corporation, Ltd., of Quebec, Canada, died at Quebec January 26. Under his direction, his firm had completed some of Canada's most outstanding buildings among which are the Chateau Frontenac, Quebec, the Canadian Bank of Commerce at Toronto, and the Supreme Court Building at Ottawa.

Grant high priorities to logging road contractors

Subcontractors who engage in the construction of logging roads and persons who carry on contract hauling of logs are entitled to the benefits of Preference Rating Order P-138, which grants an AA-2X preference rating to the logging and sawmill industry for obtaining operating supplies, repair parts and maintenance materials, according to a new interpretation issued by the War Production Board.

Normally, a single operating organization or company performs all the steps in a logging operation from opening the forest by roads and cutting the trees to delivering the logs to sawmills. In some instances, however, subcontractors perform part of the operation.

Name Liberty ship for construction pioneer

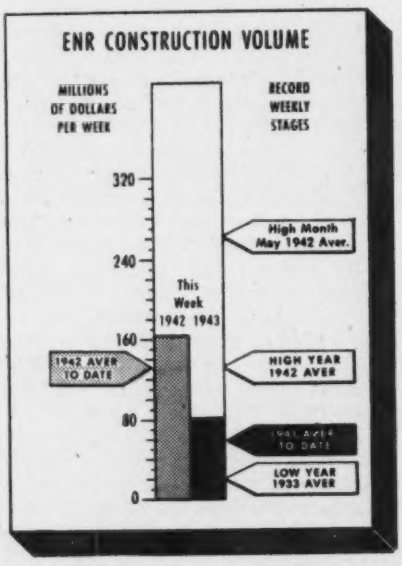
Honoring the memory of "the father of the Los Angeles Aqueduct system," the 10,500 ton Liberty freighter William Mulholland was launched recently at the California Shipbuilding yards.

Mr. Mulholland, who died in 1935, came to California in 1872 from his native Belfast, Ireland and began work as a ditch digger for the City Water Company. He rose to head the municipal water system and to become one of this country's leading hydraulic engineers. He was one of the original backers of Boulder Dam, constructed the huge Owens Valley Aqueduct, and did much of the preliminary work on the $225,000,000 aqueduct system now supplying Los Angeles with drinking water.

CONTRACTS AND CAPITAL

ENGINEERING CONSTRUCTION volume for the week totals $81,796,000, an increase of 95 percent over the preceding week, but 49 percent below the corresponding 1942 week. Private construction climbs to its highest weekly volume since last October, and is 160 percent above a week ago. It is, however, 52 percent lower than a year ago. Public construction is up 88 percent compared with last week, but is 49 percent under the 1942 week. Federal work tops the preceding week by 92 percent, while declining 46 percent from last year.

The current week's total brings 1943 volume to $308,622,000, an average of $61,724,000 for each of the five weeks. On the weekly average basis, 1943 construction is 53 percent below that reported for the six-week period in 1942.



Private work is 57 percent lower, and public construction is down 53 percent from a year ago, when adjusted for the difference in the number of weeks reported.

In the classified construction groups, gains over last week are in sewerage, industrial buildings, public buildings, and unclassified construction. All classes of work are below their respective totals for the corresponding week last year.

New capital for construction purposes for the week totals $908,000, entirely state and municipal bond sales. This compares with $2,424,000 recorded for the week last year.

CONTRACTS
(Thousands of dollars)

	Week Ending Feb. 5 1942	Jan. 28 1943	Feb. 4 1943
Federal	$129,900	$36,488	$70,00
State & Municipal	9,543	1,349	1,35
Total public	$139,443	$37,837	$71,35
Total private	21,647	4,018	10,44
TOTALS	$161,090	$41,855	$81,79
Cumulative 1943 (5 weeks)			$308,62
1942 (6 weeks)			$789,87

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1942 6 weeks	1943 5 weeks
NON-FEDERAL	$112,338	$5,40
Corp. Securities	24,565	.....
State & Mun.	76,444	3,90
R.F.C. loans	11,329	1,50
FEDERAL	$450,000	.....
TOTAL CAPITAL	$562,338	$5,40

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Jan. '43	283.45	136.2
Building Cost	Jan. '43	226.87	122.6
Volume	Dec. '42	227	100

FHA MORTGAGES

	Week Ending Jan. 31 1942	Jan. 23 1943	Jan. 30 1943
Selected for appraisal			
Title II	$14,373	$3,318	$3,716*
Title VI	$16,588	$10,134	$6,732*

* Subject to revision.